

# A Clinical Study of Cholelithiasis at a Tertiary Health Care Centre

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## Abstract

**Introduction:** Cholelithiasis is the most common disease state involving the gallbladder and biliary tree. Gallstones become symptomatic only when they obstruct a visceral structure. In developing countries, there exists a trend toward an increasing prevalence of the risk factors for gallstone disease. **Materials and Methods:** Cases were selected after applying inclusion and exclusion criteria. Thereafter data collection was done by meticulous history taking, clinical examination, appropriate laboratory and radiological investigations, operative findings, and post operative evaluation of cases. **Results:** This study comprised of 52 cases. Female to male ratio was 15:11. The most common presenting complaint was pain in abdomen in 49 (94.23%) patients. On clinical examination most common sign was tenderness in 48 (92.31%) patients. Abdominal ultrasonography showed gallstones in all cases. Either laparoscopic or open cholecystectomy was performed. Complications included wound infection, haemorrhage, and bile duct injury. On histo-pathological examination the most common finding was chronic Cholecystitis seen in 39 (75.00%) cases. **Conclusion:** The incidence of disease was more in females. The most common complaint was pain and the most common sign was tenderness. Abdominal ultrasonography should be imaging study of choice for suspected cases of cholelithiasis. Laparoscopic cholecystectomy is the procedure of choice.

**Keywords:** Cholecystectomy, Cholelithiasis

## 1. Introduction

Cholelithiasis is the most common disease state involving the gallbladder and biliary tree<sup>1,2</sup>. The prevalence of gall bladder stones shows wide variations in different parts of the world. In India it is estimated to be around 5% on the other hand in western world it is 10-15%<sup>3</sup>. Gallstones remain asymptomatic in majority of cases<sup>2</sup>. They become symptomatic only when they obstruct a visceral structure for example cystic duct, common bile duct<sup>1</sup>. As such approximately, one to two per cent of asymptomatic patients are likely to develop biliary symptoms requiring surgery per year. This makes cholecystectomy one of the most common surgeries performed by general surgeons<sup>2</sup>.

In developing countries, there exists a trend toward an increasing prevalence of the risk factors for gallstone disease. The changing incidence in developing world is mainly attributed to changes in life style, wide scale availability of investigations particularly ultrasound in urban as well as rural areas. Decreases in cost of investigation

and increasing affordability due to changes in the socio-economic conditions have contributed towards this.

This increased incidence of gallstones disease, its variable presentations, our obscure understanding of pathogenesis of gallstone disease, lack of definitive strategies for prevention and non-availability of efficient non-surgical therapies<sup>4</sup>, emphasise need of further studies to understand this malady.

## 2. Aims and Objectives

1. To study the clinical profile of cholelithiasis.
2. To study management outcome of cholelithiasis.

## 3. Materials and Methods

This observational study titled “A Clinical Study of Cholelithiasis at a Tertiary Health Care Centre” was carried out at a tertiary health care centre. Cases were selected after applying inclusion and exclusion criteria. Fifty-two cases satisfying eligibility criteria were admitted, examined,

investigated and eventually operated upon during the period from August 2016 to December 2018. Of all these cases detailed history was taken, clinical examination was done and appropriate investigations were performed.

### 3.1 Inclusion Criteria

1. Age criteria (12–65)
2. Symptomatic cases of cholelithiasis
3. Cases not responding to conservative treatment

### 3.2 Exclusion Criteria

Gall bladder stone patients with

1. Pregnancy
2. Pancreatitis
3. Malignancy (Gall bladder, hepatobiliary tract)
4. Age below 12 yrs and above 65 yrs
5. CBD calculi
6. Patient not willing to be part of the study

### 3.3 Surgical Procedures

All the operative procedures were performed by a single consultant surgeon. All the surgeries were performed under general anaesthesia. Risks involved, possible complications of surgery were explained to patients, concerned relatives. At the end of which written, informed consent was taken. Patients were considered for either Laparoscopic or Open Cholecystectomy based on history of previous abdominal surgery, obesity, and affordability. In case of presence of adhesions laparoscopic cholecystectomy was converted into open cholecystectomy as per demands of situation.

Gallbladder specimen was sent for histopathological examination. Post operatively patients were administered antibiotics, NSAIDs for analgesia and antiemetics as per need. Patients were allowed orally once bowel sounds returned. Once there was adequate pain relief, patients were ambulatory and were tolerating normal diet, discharge from hospital was planned. Pain in post operative period was rated for each patient using visual analogue score.

Sample size was calculated by the following formula:

$$n = \frac{z^2 \times p \times q}{l^2}$$

n = sample size

z = 1.96 value at 5 level of significance

p = proportion of cholelithiasis – 3.5%

q = 1 – p = 1 – 0.035 = 0.965

l = allowable error of margin – 5% = 0.05

*Statistical analysis:* Data collected was entered to excel sheet and it was analyzed by Chi-square test, unpaired t-test using Statistical Package for the Social Sciences

(SPSS) software. The significance level was considered at 95% Confidence interval level i.e. p < 0.05.

## 4. Results

**Table 1.** Distribution of the patients as per the age

Age (in years)	Number of cases (No.)	Percentage (%)
20–30	4	7.69
30–40	17	32.69
40–50	12	23.08
50–60	10	19.23
60–70	9	17.31
<b>Total</b>	<b>52</b>	<b>100.00</b>

The incidence of cholelithiasis was highest in fourth decade. The youngest patient in this study was 22 years old and the eldest was 65 years old (Table 1).

**Table 2.** Distribution of the patients as per the sex

Sex	No.	Percentage (%)
Male	22	42.31
Female	30	57.69
<b>Total</b>	<b>52</b>	<b>100.00</b>

In the present study 30 (57.69%) cases were females. Males numbered 22 (42.31%). It shows that females were more commonly affected than males. Female to male ratio was 15:11 (Table 2).

For assessment of obesity, Body Mass Index (BMI) classification was used. In the present study, maximum i.e. 30 (57.69%) participants had normal BMI (18.5–24.9). 19 (36.54%) were overweight (BMI= 25-29.9) and 3 (5.77%) had class 1 obesity (BMI = 30.0- 34.9). None of the study participants was underweight (BMI < 18.5)

The most common presenting complaint was abdominal pain noted in 49 (94.23%) cases. Other symptom- nausea and vomiting, noted in 43 (82.69%) cases. Fever and abdominal distension was complained of by 10 (19.23%) and 3 (5.77%) cases respectively.

On clinical examination tenderness was present in 48 (92.31%) cases. Guarding was the present in 9 (17.31%) cases. Palpable mass was felt in 4 (7.69%) cases. 10 (19.23%) cases were found to be febrile.

Abdominal ultrasonography was performed on which cholelithiasis was noted in all patients 52 (100%). Of which 43 (82.69%) had multiple calculi whereas 9 (17.31%) had solitary calculus. Thickening of gallbladder wall was seen in 29 (55.77%) cases. Finding of peri gallbladder collection was noted in 8 (15.38%) cases.

In the present study 33 (63.46%) cases underwent laparoscopic cholecystectomy. Open cholecystectomy was performed in 15 (28.85%) cases. 4 (7.69%) cases had to be converted from laparoscopic to open cholecystectomy.

The Visual Analogue Scale (VAS) Score for pain measurement was significantly high for open surgery successively on all six days as compared to laparoscopic cholecystectomy. This difference was statistically significant.

On taking into account operative time (in Minutes) the average time (Mean  $\pm$  SD) required, it was  $112.45 \pm 8.30$  minutes and  $71.26 \pm 9.72$  minutes for Laparoscopic and Open Cholecystectomy respectively.

Average duration of hospital stay was  $3.52 \pm 0.62$  days (Mean  $\pm$  SD) for laparoscopic cholecystectomy and  $8.16 \pm 1.54$  days (Mean  $\pm$  SD) for open cholecystectomy.

On histo-pathological examination of gallbladder specimen, 39 (75.00%) specimens were reported as chronic cholecystitis. This was the most common finding. Acute chronic cholecystitis was reported in 7 (13.46%). Acute cholecystitis was reported in 5 (9.62%) cases. Lastly, Gangrenous gallbladder was found in 1 (1.92%) case.

Overall complications occurred in 13 (25%) cases. The prevalence of complications was 21.21% in laparoscopic cholecystectomy and 31.57% in Open cholecystectomy. Haemorrhage was noted in 4 (12.12%) laparoscopic procedures. Bile duct injury was seen in 1 (3.03%) case. Port site emphysema and port site infection seen in 1 (3.03%) case each. In open cholecystectomy wound infection occurred in 4 (21.05%) cases.

## 5. Discussion

### 5.1 Age

In our study the majority of the patients were in the age group of 30-40 years, 17 (32.69%) followed by 12 (23.08%) patients in age group 40-50 years. Age group 50-60 years constituted 10 (19.23%), age group 60-70 years accounted for 9 (17.31%) patients. Here the disease seems to be common in the 4<sup>th</sup> and 5<sup>th</sup> decade. This is similar to study done by Rachamalla RR et al<sup>5</sup> where they found Mean age of study population to be  $34.12 \pm 6.2$  years and was more common during 5<sup>th</sup> decade of life. Tafazal H et al<sup>6</sup> also found the disease was common in 5<sup>th</sup> decade.

### 5.2 Sex

The majority of the patients were Female i.e. 30 (57.69%) followed by Males who constituted 22 (42.31%). This was similar study by Naik JR et al<sup>7</sup> who reported higher incidence of cholelithiasis among females Male female ratio being 3:2.

### 5.3 BMI

No patient was <18.5 (underweight); majority of the patients were of 18.5-24.9 (normal BMI); followed by

25.0-29.9 (Overweight). Those with BMI 30.0-34.9 (Class I Obesity) were 5.77%. In a study conducted by Kodama H et al,<sup>8</sup> it was found that BMI was significantly associated with an increased risk of both gallstones as well as cholecystectomy.

### 5.4 Symptoms

The most common chief complaints were pain in abdomen in 49 (94.23%) patients, followed by Nausea and Vomiting in 43 (82.69%), fever in 10 (19.23%), distension of abdomen in 3 (5.77%). These findings were similar to other studies on cholelithiasis<sup>9-11</sup>.

### 5.5 Signs

The most common signs were Tenderness in 48 (92.31%) patients followed by, Febrile in 10 (19.23%), Guarding in 9 (17.31%), and palpable mass in 4 (7.69%). These findings were similar to other studies on cholelithiasis<sup>7,9</sup>.

### 5.6 USG Findings

Abdominal ultrasonography: Stones in gallbladder seen in almost all patients (52(100.00%)). Among these Multiple stones were present in 43(82.69%), Solitary stone in 9(17.31%) patients. Thickening of Gallbladder was seen in 29(55.77%), peri-Gallbladder collection in 8(15.38%) patients. Srinivasa Rao K<sup>12</sup> found multiple Stones in 76%, Solitary Stone in 24%, Thickening of GB in 80% which is largely similar to our study. In study conducted by Sharada B et al<sup>2</sup>, multiple stones were seen in 68(75.56%) cases, Solitary stones in 22(24.44%) cases, thickening of gallbladder was seen in 72(80%) cases which are again analogous to our study.

### 5.7 Type of Surgery

Depending upon the clinical conditions and factors like history of previous surgery, obese patients and adhesions etc type of procedure was decided. Laparoscopic cholecystectomy was performed in 33 (63.46%) patients, Open cholecystectomy was carried out in 15 (28.85%). Laparoscopic cholecystectomy had to be converted into Open cholecystectomy in 4 (7.69%) cases because of multiple adhesions, possibility of bile duct injury, distorted anatomy.

### 5.8 Visual Analogue Scale (VAS) Score

In our study we observed that the Visual Analogue Score for the pain measurement was significantly high in open cholecystectomy patients successively on all six days. The pain perceived by patients undergoing open cholecystectomy was significantly higher. Consequently analgesia required was more. Broadly speaking it affected the recovery process and quality of life after operation.

This was similar to observations<sup>13</sup> found using the visual analogue pain score, that postoperatively, measurement of pain perceived was significantly less after laparoscopic cholecystectomy as compared with the open approach ( $P < 0.05$ ).

Found<sup>14</sup> that Patient who undergone the laparoscopic procedure had significantly less pain on the day of operation, on the first postoperative day and on subsequent days.

## 5.9 Operative Time

Overall the time required for Laparoscopic cholecystectomy was more i.e. Average time (Mean  $\pm$  SD) was 112.45  $\pm$  8.30 minutes. In case of open cholecystectomy this was 71.26  $\pm$  9.72 (Mean  $\pm$  SD) minutes.

This was similar to study<sup>15</sup> the operative time in their series was significantly longer in the laparoscopic cholecystectomy group.

## 5.10 Duration of Stay

Duration of stay was maximum for open surgery i.e. overall average duration of stay was 8.16  $\pm$  1.54 (Mean  $\pm$  SD) days. In case of laparoscopic cholecystectomy this was 3.52  $\pm$  0.62 (Mean  $\pm$  SD) days. Attwood SE et al<sup>13</sup> recorded similar finding that patients who had undergone laparoscopic cholecystectomy could be started on oral fluids and subsequently full diet earlier as compared to patients undergoing open cholecystectomy. Discharge from hospital is earlier.

In a study by Lujan JA et al<sup>15</sup>, the length of hospital stay averaged 8.1 days for the open cholecystectomy patients, for laparoscopic cholecystectomy it was 3.3 days ( $P < 0.001$ ). Similarly, in a study by Coccolini F et al<sup>16</sup>, the mean postoperative hospital stay was significantly shortened in the laparoscopic cholecystectomy group. The mean difference was less by 4.74 days for laparoscopic cholecystectomy.

## 5.11 Histo-pathological Findings

On histo-pathological examination the most common finding was chronic cholecystitis seen in 39 (75.00%) cases, followed by acute on chronic cholecystitis in 7 (13.46%), acute cholecystitis in 5 (9.62%), and Gangrenous Gall Bladder in 1(1.92%) case.

In a study by Awasthi N et al<sup>17</sup>, the most common histopathological finding in their study was chronic cholecystitis as in our study. It was seen in 711 cases out of 732 (97.1%). In a study by Sharada B et al<sup>9</sup>, on histopathological examination majority cases were that of chronic cholecystitis 86(95.56%). In the present study, majority of the cases were of chronic cholecystitis, although the relative percentage was lesser than other studies.

## 5.12 Complications of Surgery

Overall complications were seen in 13(25%) cases. These included haemorrhage, bile duct injury, wound infection (port site infection included), port site emphysema, and prolonged ileus.

**Table 3.** Comparison of complications

Complication	Our Study	Lujan, et al. <sup>15</sup>	Catena, et al. <sup>18</sup>	Sharada, et al. <sup>9</sup>
Wound infection*	5(9.61%)	4(1.78%)	8(5.55%)	6(6.66%)
Haemorrhage	5(9.61%)	3(1.33%)	7(4.86%)	Nil
Bile duct injury	1(1.92%)	1(0.44%)	Nil	4(4.44%)
Prolonged ileus	1 (1.92%)	12 (5.36%)	5 (3.47%)	Nil

(\*when we include port site wound infection (umbilicus) under wound infection total is 5(9.61%)).

As seen in above Table 3 wound infection was seen in 5(9.61%) cases in our study, 4 cases in open cholecystectomy and 1 case of port site wound infection. The numbers of cases are high in series under Catena, et al<sup>18</sup>. and Sharada, et al.<sup>9</sup> However, when we consider relative percentage, it was higher compared to other studies. When we consider haemorrhage it was seen in 5(9.61%) cases in our study. Again, considering relative percentage its occurrence was highest in our study. Haemorrhage was not seen even in a single case in study by Sharada, et al.<sup>9</sup> When we go next to bile duct injury it was seen in 1(1.92%) case in our study. Occurrence of bile duct injury was highest in study by Sharada, et al<sup>9</sup>. i.e. 4 (4.44%). No bile duct injury was seen in the study done by Catena F et al<sup>18</sup>. Lastly when we look at prolonged ileus, it was seen in only 1(1.92%) case in our study. Lujan JA et al<sup>15</sup> found higher prevalence of prolonged ileus (5.36%). In the study by Catena F et al<sup>18</sup>, it was seen in 5(3.47%) cases. It was not seen in any case in the study by Sharada et al<sup>9</sup>.

## 6. Summary and Conclusion

- The most common age group for occurrence of cholelithiasis in the present study was in the 4<sup>th</sup> decade.
- The incidence of disease was more in females.
- The most common complaint was pain in abdomen, followed by nausea and vomiting, fever, and distension of abdomen. Such clinical features should arouse suspicion of cholelithiasis.
- The most common signs were tenderness and fever.
- Abdominal ultrasonography found that all study participants had gallstones. So, USG can be a diagnostic modality of choice for suspected cholelithiasis patients.

- Laparoscopic cholecystectomy is the procedure of choice. However due to inadvertent circumstances in few cases, laparoscopic procedure had to be converted into Open surgery. Hence one should not hesitate to convert Laparoscopic cholecystectomy into open surgery whenever there seems difficulty in procedure or patients conditions does not permit it.
- Overall pain perceived was less in Laparoscopy group so analgesia required was less.
- Duration of stay was significantly less for laparoscopic cholecystectomy so this could be better option over open counterpart.
- On histo-pathological examination most common finding was chronic cholecystitis.
- The overall prevalence of complications of open cholecystectomy and laparoscopic cholecystectomy were comparable with each other but considering faster recovery and less pain laparoscopic cholecystectomy seems to be superior to open cholecystectomy.

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